	Background Statistics for Data Sets with Non-Detects						
User Selected Options							
Date/Time of Computation	7/30/2013 1:34:51 PM						
From File	WorkSheet.xls						
Full Precision	OFF						
Confidence Coefficient	95%						
Coverage	95%						
rent or Future K Observations	1						
mber of Bootstrap Operations	2000						

PAHs

General Statistics

Total Number of Observations	68	Number of Missing Observations	0
Number of Distinct Observations	65		
Number of Detects	57	Number of Non-Detects	11
Number of Distinct Detects	57	Number of Distinct Non-Detects	8
Minimum Detect	6.12	Minimum Non-Detect	1.5
Maximum Detect	198.2	Maximum Non-Detect	10
Variance Detected	2217	Percent Non-Detects	16.18%
Mean Detected	74.84	SD Detected	47.09
Mean of Detected Logged Data	4.072	SD of Detected Logged Data	0.785

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.991	d2max (for USL)	3.073

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.937	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0.00741	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.0912	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.117	Detected Data appear Normal at 5% Significance Level
Detected Data appear Approximate Normal at 5% Significance Level		

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	63.01	SD	50.5
95% UTL95% Coverage	163.6	95% KM UPL (t)	147.9
90% KM Percentile (z)	127.7	95% KM Percentile (z)	146.1
99% KM Percentile (z)	180.5	95% KM USL	218.2

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	63.07	SD	50.82
95% UTL95% Coverage	164.2	95% UPL (t)	148.4
90% Percentile (z)	128.2	95% Percentile (z)	146.7
99% Percentile (z)	181.3	95% USL	219.2
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.244	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.762	etected data appear Gamma Distributed at 5% Significance Lev
K-S Test Statistic	0.0571	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.119	etected data appear Gamma Distributed at 5% Significance Lev
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only

k hat (MLE)	2.203	k star (bias corrected MLE)	2.099
Theta hat (MLE)	33.96	Theta star (bias corrected MLE)	35.65
nu hat (MLE)	251.2	nu star (bias corrected)	239.3
MLE Mean (bias corrected)	74.84		
MLE Sd (bias corrected)	51.65	95% Percentile of Chisquare (2k)	9.807

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

	A	B	C	D	E	F	G	H	I	J	K	L
63	GROS may not be used when kstar of detected data is small such as < 0.1										
64	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
65	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
66	Minimum					1.469	Mean					63.68
67	Maximum					198.2	Median					54.96
68	SD					50.1	CV					0.787
69	k hat (MLE)					1.172	k star (bias corrected MLE)					1.13
70	Theta hat (MLE)					54.32	Theta star (bias corrected MLE)					56.34
71	nu hat (MLE)					159.4	nu star (bias corrected)					153.7
72	MLE Mean (bias corrected)					63.68	MLE Sd (bias corrected)					59.9
73	95% Percentile of Chisquare (2k)					6.487	90% Percentile					142.3
74	95% Percentile					182.7	99% Percentile					275.9
75	The following statistics are computed using Gamma ROS Statistics on Imputed Data										
76	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
77					WH	HW					WH	HW
78	Approx. Gamma UTL with 95% Coverage				223.1	246.1	95% Approx. Gamma UPL				183.9	197.6
79	95% Gamma USL				402.5	487.1						
80											
81	The following statistics are computed using gamma distribution and KM estimates										
82	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
83	k hat (KM)					1.557	nu hat (KM)					211.7
84					WH	HW					WH	HW
85	Approx. Gamma UTL with 95% Coverage				243.5	280	95% Approx. Gamma UPL				197.5	219.5
86	95% Gamma USL				458.1	591.2						
87											
88	Lognormal GOF Test on Detected Observations Only										
89	Lilliefors Test Statistic				0.105	Lilliefors GOF Test						
90	5% Lilliefors Critical Value				0.117	Detected Data appear Lognormal at 5% Significance Level						
91	Detected Data appear Approximate Lognormal at 5% Significance Level										
92											
93	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects										
94	Mean in Original Scale					64.62	Mean in Log Scale					3.809
95	SD in Original Scale					49.01	SD in Log Scale					0.938
96	95% UTL95% Coverage					292.1	95% BCA UTL95% Coverage					183.7
97	95% Bootstrap (%) UTL95% Coverage					187.1	95% UPL (t)					218.2
98	90% Percentile (z)					150.1	95% Percentile (z)					211.1
99	99% Percentile (z)					400.1	95% USL					806.4
100											
101	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
102	KM Mean of Logged Data					3.49	95% KM UTL (Lognormal)95% Coverage					661.4
103	KM SD of Logged Data					1.509	95% KM UPL (Lognormal)					413.8
104	95% KM Percentile Lognormal (z)					392.3	95% KM USL (Lognormal)					3387
105											
106	Background DL/2 Statistics Assuming Lognormal Distribution										
107	Mean in Original Scale					63.07	Mean in Log Scale					3.497
108	SD in Original Scale					50.82	SD in Log Scale					1.52
109	95% UTL95% Coverage					680.9	95% UPL (t)					424.5
110	90% Percentile (z)					231.6	95% Percentile (z)					402.4
111	99% Percentile (z)					1134	95% USL					3528
112	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
113											
114	Nonparametric Distribution Free Background Statistics										
115	Data appear to follow a Discernible Distribution at 5% Significance Level										
116											
117	Nonparametric Uppper Limits for BTVs(no distinction made between detects and nondetects)										
118	Order of Statistic, r					67	95% UTL with95% Coverage					187.1
119	Approximate f					1.763	Confidence Coefficient (CC) achieved by UTL					0.86
120	95% UPL					167.5	95% USL					198.2
121	95% KM Chebyshev UPL					284.8						
122											
123	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background										
124	data set free of outliers and consists of observations collected from clean unimpacted locations.										

	A	B	C	D	E	F	G	H	I	J	K	L
125	The use of USL tends to provide a balance between false positives and false negatives provided the data
126	represents a background data set and when many onsite observations need to be compared with the BTV.
127	